Preventing and treating urinary incontinence – the role of pelvic floor physiotherapy

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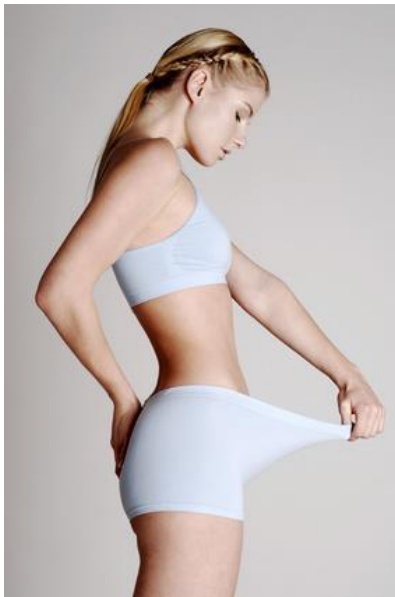
CANADA

Outline

- Pathophysiology of urinary incontinence (UI)
- Efficacy of physiotherapy modalities for preventing UI
- Efficacy of physiotherapy modalities for treating UI and related sexual dysfunctions across the lifespan



Pathophysiology of UI – Pregnancy & Childbirth

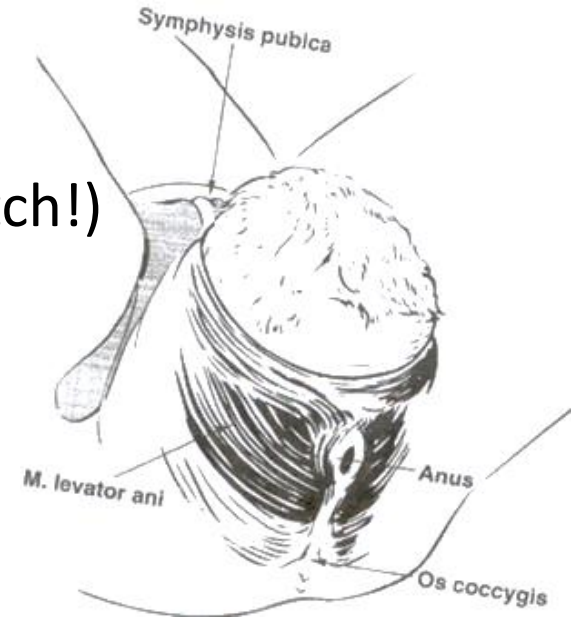
Prevalence of incontinence

- 30-42% during pregnancy (Wesnes, 2007)
- 15-30 % after childbirth (Milsom, 2013)

  Natural recovery (UI 3 month postpartum = high risk it will persist) (Viktrup 2002)

Pregnancy and childbirth

1. Pelvic floor muscle (PFM) trauma (245% stretch!)
2. Damage to the pelvic nerve
3. Injury to the connective tissue supports
4. Vascular damage

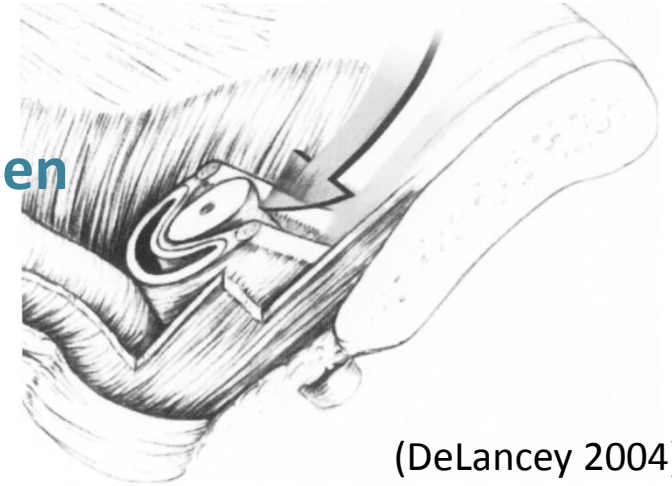


International Consultation on Incontinence (ICI) (Koelbl 2013; Milsom 2013)

Pathophysiology of UI – Pregnancy & Childbirth

Implication of the PFMs in continence

- Bladder neck support – the hammock hypothesis (DeLancey, 2004)
- Sphincteric action (Wallner, 2009)



(DeLancey 2004)

PFM function in continent / stress UI women

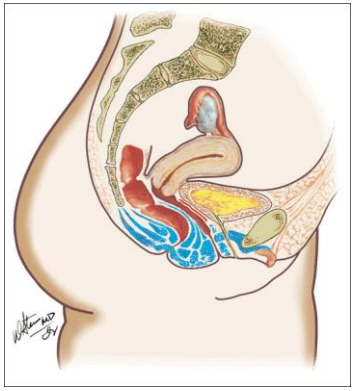
(Morin, 2004; Verelst, 2007; Shishido, 2008)

- Tone/passive forces ↓
- Strength ↓
- Speed of contraction/coordination ↓
- Endurance ↓

Pathophysiology of UI – Pregnancy & Childbirth

Postpartum sexual dysfunctions

- Prevalence of 41-83% postpartum sexual dysfunction, especially following traumatic vaginal delivery (Leeman, 2012)
  - Related to UI (Handa, 2007)



The relation between PFM function and sexual function

- Strength - correlated with satisfaction (r=0.47) (Martinez, 2014)
- Endurance – correlated with FSFI orgasmic domain (r=0.26) Sexual arousal (r = 0.32) (Lowenstein, 2010)

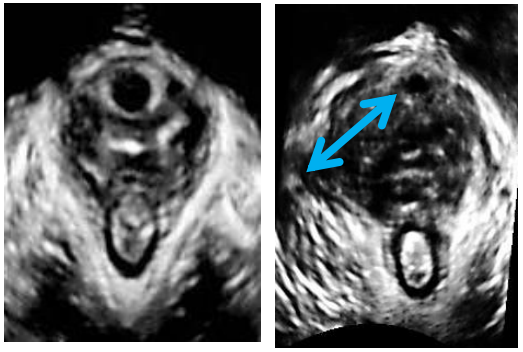
PFM contraction occurs during arousal and intensifies with orgasm and that PFM tone is related to vaginal sensation (Graber 1979, Messe 1985, Shafik 2000)

Superficial PFMs such as the bulbospongiosus and ischiocavernous are implicated in erection of the clitoris by blocking the venous escape of blood from the dorsal vein (Puppo 2011)

Pathophysiology of UI – Pregnancy & Childbirth

Puborectalis avulsion

- Prevalence 21%-36% (Dietz 2005; Abdool 2009)



- Consequences:
  - Enlargement of the levator hiatus and an altered contractility (Cyr 2015; Abdool 2009)
  - Urogynecological symptoms (Van Delft 2014)
    - UI
    - Pelvic organ prolapse that developed and evolved rapidly
  - Sexual dysfunction (Thibault-Gagnon 2014; Van Delft 2014)

Pathophysiology of UI – Aging & menopause

- **Bladder**
  - Decreased capacity and sensation of filling
  - Increased detrusor overactivity
  - Decrease detrusor contractile function
  - Increased residual urine
- **Urethra**
  - Decreased closure pressure
- **PFM function**
  - Bladder neck displacement ↑ (Constantinou 2002)
  - Strength ↓ (Weemhoff, 2010)
  - Muscle mass ↓ (Constantinou 2002)
- **Genitourinary syndrome of menopause**

Voluntary urinary inhibition reflex (Shafik 2003; Godek 1975)

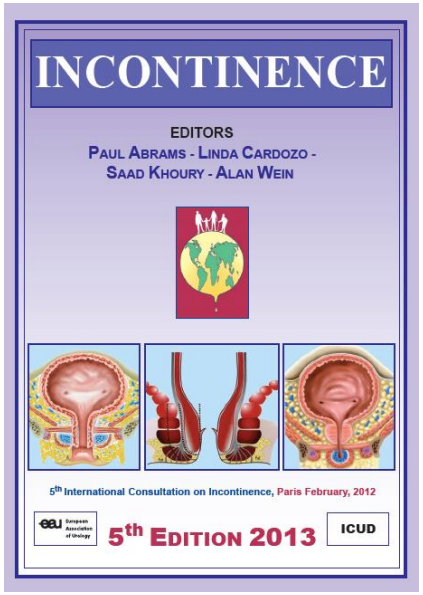
(ICI Wagg, 2013)

Is physiotherapy effective for preventing UI?

Grade of recommendations

International Consultation on Incontinence 2013

- Grade A: Systematic reviews of RCTs (Cochrane reviews)
  Data from two or more RCTs
- Grade B: Single trials
- Grade C: Observational studies
- Grade D: Committee opinion



PFM training for preventing UI

- 10 studies
  (Agur 2008; Gaier 2010; Gorbea 2004; Kocaoz 2013;Morkved 2003; Pelaez 2014;Reilly 2002; Sampselle 1998; Sangsawang 2016; Stothers 2002;)

Continent women who began PFMT during pregnancy were significantly less likely to report UI

- in late pregnancy (56% less likely)
- up to 12 weeks postpartum (50% less likely)
- and between 3-6 months postpartum (29% less likely)

Dose effect

More intensive and more supervised = more effective

(Boyle 2012 Cochrane review; ICI Moore 2013)

Physiotherapy for preventing UI

Recommendation Grade A

Continent pregnant women should be offered a supervised and intensive PFM training to prevent antepartum and postpartum UI

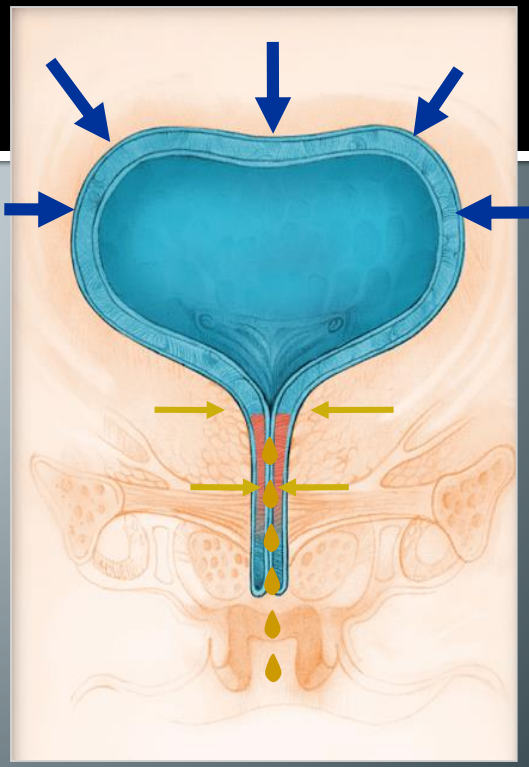
The usual approach to PFM training in pregnancy (verbal or written instruction without confirmation of correct contraction or supervision of training) needs to be reviewed

Additional trials are needed to determine long-term benefits (>12 months postnatal)

RCTs are needed to investigate efficacy in multiparous women as well as in other age groups

(Boyle 2012 Cochrane review; ICI DumoulinMoore 2013)

Is physiotherapy effective for treating UI?



PFM training vs no treatment/control

- **18 studies** (Aksac 2003; Beuttenmuller 2010; Bidmead 2002; Bø 1999; Burgio 1998; Burns 1993; Carneiro 2010; Castro 2008; Diokno 2010; Henalla 1989; Henalla 1990; Hofbauer 1990; Kim 2007; Kim 2011; Kim 2011a, Lagro-Janssen 1991; Pereira 2011; Yoon 1999)
  (665 women in PFM training vs 616 placebo)
  - In women with SUI, the PFM training group was about **17 times** more likely to report a cure or improvement (56.1% cure) compared to the controls (6% cure)
  - In women with UI of all types, the women were about two and a half times as likely to report a cure

(Dumoulin 2014 Cochrane review; ICI Moore 2013)

PFM training vs no treatment/control

- **18 studies** (Aksac 2003; Beuttenmuller 2010; Bidmead 2002; Bø 1999; Burgio 1998; Burns 1993; Carneiro 2010; Castro 2008; Diokno 2010; Henalla 1989; Henalla 1990; Hofbauer 1990; Kim 2007; Kim 2011; Kim 2011a, Lagro-Janssen 1991; Pereira 2011; Yoon 1999) (665 women in PFM training vs 616 placebo)

  - The most intensive PFM training program possible should be provided (in terms of exercise dose, health professional teaching, and supervision) and supervised programs are better than self-directed programs ; more health professional contact is better than less **(Grade of recommendation A)**

  - Supervised PFM training should be offered as a first-line conservative therapy for women of all ages with SUI, urge or MUI **(Grade of recommendation A)**

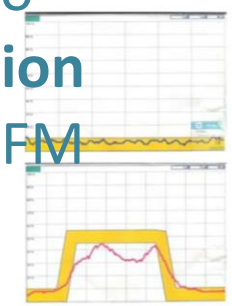
(Dumoulin 2014 Cochrane review; ICI Moore 2013)

Which modalities or combinaison of modalities are more effective?

Addition of biofeedback

- Clinic biofeedback (Burgio 2002; Burns 1993; Berghmans 1996; Glavind 1996; Wang 2004)
  Home biofeedback (Aksac 2003; Mørkved 2002; Shepherd 1984; Laycock 2001)

  Two new studies (Galea 2013; Aik Ong 2015) showed a beneficial effect of adding BF to PFM training while two others (Hirakawa 2013; Mononai 2013) found non significant results



- Although studies are inconsistent, there does not appear to be a clear benefit of adding clinic **(Grade of recommendation A)** or home based BF **(Grade of recommendation B)** to a PFM training programme.

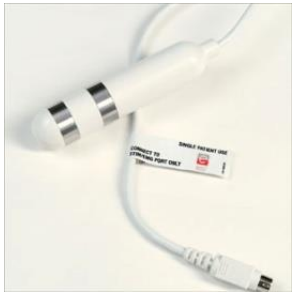
(ICI Moore 2013)

Which modalities or combinaison of modalities are more effective?

Electrical stimulation (Estim)

- **10 studies** (Sprujit 2003; Bø 1999; Hahn 1991; Laycock 1988; Henalla 1989; Hofbauer 1990; Castro 2008; Smith 1996; Wang 2004; Arruda 2008)

  A lot of variability in treatment protocols



- EStim might be better than no treatment in improving symptoms (Grade of recommendation B)
- PFMT is better than EStim as first line conservative therapy, particularly if PFMT is intensively supervised (Grade of recommendation B)

(ICI Moore 2013)

Which modalities or combinaison of modalities are more effective?

Bladder training (BT)

- **5 studies** (Yoon 2003; Fantl 1991; Jarvis 1980; Dougherty 2002; Lagro-Janssen 1992)
  (515 women)

  Typical BT regimen
  - Voiding interval increased 15-30min/week
  - Bladder inhibition strategies (distraction, PFM contraction…)
  - Self monitored diary

  The few trials available were small and of variable quality, there is minimal Level 1 evidence that BT may be an effective treatment for women with UUI, SUI, and MUI

- BT is an appropriate first line conservative therapy for UI in women (Grade of recommendation A). Additional high quality studies are needed that examine the effect of BT versus no treatment in treatment of women with UUI, SUI, and MUI.

(ICI Moore 2013)

Which modalities or combinaison of modalities are more effective?

Resistance device

- **3 studies** (Wells 1999; Ferguson 1990; Delgado 2009) (Kashanian 2011)

➢ No benefit from adding intravaginal devices to increase resistance in PFM training

Vaginal cones

- **14 studies** (Wilson 1998; Williams 2006; Bø 1999; Castro 2008; Laycock 2001; Haken 1991; Arvonen 2001; Cammu 1998; Gameiro 2010; Peattie 1988; Arvonen 2002; Laycock 1988; Harvey 2006; Pereira 2012) (Golmakani 2014)

Limited evidence suggests that VCs may be similar to PFM training
No statistically significant differences in subjective improvement/cure or leakage episodes per day or pad test.
Notably, with PFM training the leakage index was lower in the pooled data from two trials.
Inability to use VCs and side effects were reported in five trials.
For women with stress or mixed UI, PFM training is better than VCs as first-line conservative therapy (Grade of recommendation B)

(Herbison 2013 Cochrane review, ICI Moore 2013)

Which modalities or combinaison of modalities are more effective?

Combinaison of modalities

- **11 studies** (Burgio 2010; Chen 2008; Ghoniem 2005;Hofbauer 1990; Ishiko 2000; Jeyaseelan 2002; Jin 2012; Kim 2011; Richter 2010; Wise 1993; Wyman 1998)

  - Non-significant effect of adding PFM training to other active tx such as vaginal cone, bladder training, electrical stimulation)

  It should be underlined that there few studies and most of them are underpowered

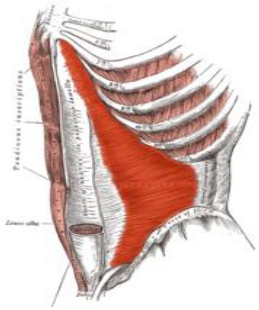
(Ayeleke 2013 Cochrane review)

Which modalities or combinaison of modalities are more effective?

Indirect muscle training vs PFM training

- Paula method (Liebergall-Wischnitzer 2005; 2009)
- Sapsford approach – transverse abdominis training (Hung 2010)
- External rotator muscles (Jorge 2014)
- Pilates (Savage 2015)

➢ Indirect methods did not appear to be better than direct PFM contractions, noting that some study data were confounded by differences in the amount of contact time with health professionals



(ICI Moore 2013)

Which modalities or combinaison of modalities are more effective?

Adding indirect methods to PFM training

- Transverse abdominis training (Sriboonreung 2011; Dumoulin 2004; Konstantidinidou 2013)
- External rotator muscles (Donahoe 2012; Marques 2014)

➢ Non- significant effect of adding indirect methods to PFM training

(ICI Moore 2013)

Efficacy of physiotherapy for improving sexual function

- **8 studies** (Wilson 1998; Bo 2000; Citak 2010; Handa 2011; Liebergall-Wishnitzer 2012; Yang 2012; Eftekhar 2014; Braekken 2015)
  + (Zahariou 2008; Sacamori 2015; Giuesepe 2007)

  - PFM training is suggested to improve sexual function in women either postnatally or those with pelvic floor disorders **(Level 1)**

*Predictor of impromment in sexual function: **higher adherence to PFM** training, higher parity, **greater improvement in their PFM strength**, and greater decrease in the frequency of urine leakage (sacomori 2015)*

Clinicians may prescribe PFM training to improve sexual function
Adherence to a dose-effective level of therapy seems a key factor
It may confer benefit on coexisting pelvic floor disorders **(Grade of recommendation B)**

(Ferreira 2012 Systematic review)

Does PFM training work in the long-term?

- **19 studies** – meta-analysis not possible due to heterogeneity
  1141 women with stress UI and mixed UI

  - Losses to follow-up (1 to 15 years) were between 0% (Cammu1991; Bo 1996) and 39% (Kiss2002)
  - Initial success rate on SUI and MUI was maintained in long-term (Klarskov 1991; Dougherty 1993; Lagro-Janssen 1998; Alewijnse 2003; Parkkinen 2004)

    In 7 studies, long-term success after short-term success 41%-85% (Mouritsen 1991,Klarskoz 1991,Kondo 1996, 2007; Cammu 2000; Aukee 2004; Bo 2005)

    7 year RCT – success maintained in 63% (Dumoulin 2013)
  - Long-term adherence 10% (Holley 1995) and 70% (Bo 1996)

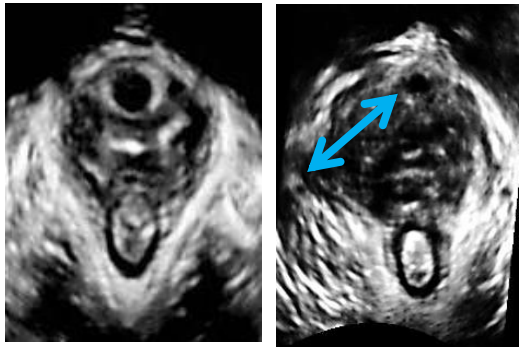
    Related to satisfaction (Lagro-Janssen 1998)

    Long-term effect attributed to the knack (Bo 1996; Cammu 2000)

(Bo, 2013 Systematic review)

Is physio effective in women with avulsion ?

- **Physiotherapy delivered in a class setting was <u>not</u> effective in women with avulsion** (Hilde 2013)
  - Group intervention (n=27) did not reduce the prevalence of UI (44.4% physio and 50% control; RR0.89:0.51-1.56) or improve PFM function (p=0.28) compared to the control group (n=28) in women with avulsion
  - Individually supervised treatment might be more successful in women with major trauma



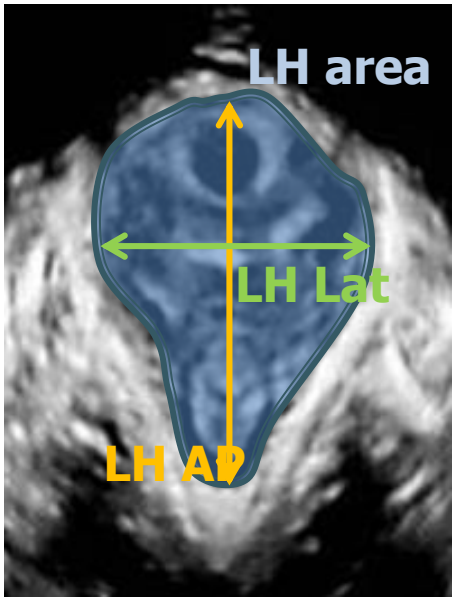
(Morin, 2015)

Is physio effective in women with avulsion ?

- **Individualized intensive physio (ES, BF, PFM training)** (Morin 2015)
  - PFM physiotherapy can improve PFM morphometry in women with puborectalis avulsion (n=16) in comparison with standard care (n=12)
  - Women with avulsion (n=26) respond similarly to women without avulsion in terms of PFM morphometry when receiving physiotherapy

This “proof of principle” study illustrated that alteration in PFMs can be improved or corrected by physiotherapy

Larger RCT for assessing UI



(Morin, 2015)

Does age affect the outcomes ?

- **6 studies in women over 60 years old**

  PFMT versus EStim (Sprujit 2003)
  PFMT versus drug (Burgio 1998; Wells 1991)
  PFMT versus BT (Sherburn 2011)
  PFMT versus PFMT+BF versus no treatment (Burns 1993)
  PFMT versus placebo/sham/control (Burgio 2002; 1998)

  - Similar efficacy than other studies involving younger patients
  - No significant association between age and outcomes (Hay-Smith 2006; Burgio 2003; Theofrastous 2002; Wyman 1998)

    Bo (1992) even found that treatment responders were statistically significantly older.
  - There is no good evidence to date that suggests that 'healthy' older women with UI benefit less from PFM training compared to younger women.
    PFM training should therefore be offered as first-line therapy to all women with stress, mixed and urge UI

(ICI Moore 2013)

Other promising treatments in aging

Virtual reality and danse

Step Mania game that integrated PFM contraction as well as strengthening and balance exercises.

- Reduced frequency and quantity of urine leakage decreased and patient-reported symptoms
- QoL improved significantly. Satisfaction with treatment (91%)
- Improvement in dual task assessment

Non-inferiority RCT ongoing (n=334)

(Elliott 2015; Fraser 2014)

Thank you!